

REMARKS

I. Summary of the Office Action

Claims 1-18 were pending in the application. Of these, claims 4, 5, and 10 have been withdrawn from consideration.

Claims 1-3, 6-9, and 11-18 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

Claims 1-3, 6-9, and 12-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hurst Jr. U.S. Patent No. 6,038,000 (hereinafter "Hurst") in view of Zhang et al. U.S. Patent No. 6,611,624 (hereinafter "Zhang").

Claim 11 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hurst.

Claims 16-18 are rejected under 35 U.S.C. § 102(b) as being unpatentable by Freeman et al. U.S. Patent No. 5,724,091 (hereinafter "Freeman").

II. Summary of Applicants' Reply

Applicants have amended independent claims 1 and 13 in order to particularly point out and distinctly claim the subject matter which applicants regards as their invention. Applicants have cancelled claims 16-18.

The Examiner's rejections of the claims are respectfully traversed.

Reconsideration of this application is respectfully requested.

III. The Rejection Under 35 U.S.C. § 112, First Paragraph

The Examiner rejected claims 1-3, 6-9, and 11-18 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In particular, the Examiner contends that the phrase “wherein such changing of multiplexing does not affect the content of said plurality of data streams” is not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, has possession of the claimed invention.

Applicants respectfully disagree and refer the Examiner to applicants’ specification at page 9, lines 5-7, which states that:

For this embodiment, the bandwidth should be increased in the period before the gap, in order to pre-send all of the information that would have been sent during the gap if the stream distribution was constant.

Applicants also wish to refer the Examiner to applicants’ specification at page 10, lines 13-15, which states that:

One method is if the multiplexer has on-demand control over the influx of data, and can request extra data at any time. To create this gap in a continuous stream of data without control over the source of the data, a delay buffer 75 is used.

These and other portions of applicants’ specification describe that the content of individual data streams is not changed. Rather, applicants’ approaches multiplex the data streams at a higher rate.

Accordingly, applicants submit that claim 1-3, 6-9, and 11-18 complies with the written description requirement, and respectfully request that the Examiner withdraw the rejection of claims 1-3, 6-9, and 11-18 under 35 U.S.C. § 112, first paragraph.

IV. Summary of Applicants' Independent Claims

As described in the specification, applicants' independent claims are directed to seamless switching between a plurality of data streams. At least one aspect of the invention is addressed to, for example, the problem of "allow[ing] a receiver, such as a digital set top box, to seamlessly switch between multiple channels and produce output with no switching artifacts" while "using presently deployed receiver systems such as digital set top boxes (STB). (Applicants' specification, page 5). In addition, "[n]o extra buffering is required to be added to present receivers" and "extensive modification to the existing devices" is not required. (*Id.*). Applicants' independent claims address these problems by preparing the data streams prior to transmission to a receiver.

By preparing the transport stream in such a way that the playback buffer is filled with frames from before the cross over point X 52, the buffered frames can bridge the switching delay 56. So instead of delaying the transmission, an embodiment of the present invention sends frames ahead of time and uses the buffer and presentation timing to its advantage.

(Applicants' specification, page 8). That is, applicants' approach is to pre-compute the potential starting points and end points and modify the data streams (e.g., by increasing the data rate at given points and inserting gaps) to enable seamless switching on a receiver. This pre-computation is performed prior to transmission to the receiver.

More particularly, the claimed invention accomplishes this by providing a method and a system for preparing a plurality of data streams prior to transmitting them to a switching device or a receiver (hereinafter "a receiver"). The data streams include data that is divided into segments and the segments include synchronized starting points and end points. To prepare the plurality of data streams, the plurality of data streams are multiplexed together. Before an end point of a segment, the data rate of the multiplexed data streams is increased, where changing the multiplexing does not affect

the contents of the data streams. Gaps are also provided in the multiplexed data streams between end points and starting points. After preparing the data streams, they are transmitted to the receiver.

V. The Rejection of the Claims

The Examiner rejected each of independent claims 1 and 13 under 35 U.S.C. § 103(a) as being unpatentable over Hurst in view of Zhang. The Examiner's rejection of these claims is respectfully traversed.

Hurst discloses a method and apparatus for splicing a first compressed digital information stream into a second compressed digital information stream without time gaps. Hurst sends the compressed streams to a splicer. A controller monitors the two streams until the appropriate entrance and exit points are found.

When an appropriate entrance point is found, the contents of the synchronization buffer are discarded (i.e., the buffer is 'flushed') and the in-point is stored in the first memory portion of the synchronization buffer.

The process of searching for in-points and flushing the buffer is repeated until the first input bitstream is selected by the splicer. In this manner, there is always an in-point positioned at the end of the synchronization buffer of the stream that is not being currently output.

(Hurst, column 9, lines 45-56). In response to a control signal, Hurst splices the first stream into the second stream using those identified points.

In stark contrast to Hurst, independent claims 1 and 13 as amended recite a system and method of preparing a plurality of data streams prior to transmitting them to a receiver. Rather than preparing the data streams prior to transmitting them to a receiver, Hurst requires that a controller monitors the incoming streams as it is being transmitted until the appropriate entrance and exit points are found.

Because Hurst's approach requires additional buffers and monitors data streams for in and out points as they are received, Hurst cannot prepare the data streams prior to transmitting them to a receiver.

The splicer of Hurst would need to be built and deployed for every household with a receiver, where the splicer monitors the data streams as they are transmitted to the receiver.

In addition, Hurst does not increase the data rate of the multiplexed data streams. Hurst simply discloses that in-points are found using a controller. As in-points are found, each in-point is stored in a buffer and then flushed from the buffer when the next in-point is found. This is repeated until a control signal is received, thereby "causing the switch to couple the buffered information stream to an output." (Hurst, column 2, lines 14-15). Thus, Hurst is not increasing the data rate of the multiplexed data streams before end points in a data stream prior to transmitting the data stream to a receiver. In other words, Hurst simply discloses that the contents of the buffer are discarded when they are not used.

The Examiner correctly submits that applicants' independent claims have novelty over Hurst, recognizing that "Hurst does not clearly disclose 'multiplexing said plurality of data streams to said switching device' and 'increasing a data rate of the plurality of data streams by changing the multiplexing for said plurality of data streams wherein such changing of multiplexing does not affect the contents of the plurality of data streams.'" However, the Examiner asserts that Zhang discloses these features of applicants' independent claims, and that it would have been obvious to combine Hurst with Zhang. Applicants respectfully disagree.

Zhang discloses a system and method for bitstream splicing using a first pre-buffer, a second pre-buffer, a seamless splicer, and a post-buffer. The first and second pre-buffers are input buffers to

the seamless splicer and the post-buffer is coupled to the output of the seamless splicer. The seamless splicer receives the two streams via the first and second pre-buffers and produces a single spliced bitstream at its output in response to the cue tone signal. The seamless splicer provides the first bitstream, then re-encodes portions of the first and second bit streams proximate the splicing points and then switches from the first bitstream to the second bitstream.

Similar to the Hurst system, Zhang does not preparing a plurality of data streams prior to transmitting the plurality of data streams to the receiver. Unlike the present invention, where “[n]o extra buffering is required to be added to present receivers,” Zhang modifies the receiver by adding multiple buffers. (Applicants’ specification, page 5). This is apparent from FIG. 6, where a first pre-buffer and a second pre-buffer are added as input buffers to the seamless splicer and a post-buffer is added as an output buffer to the seamless splicer. Zhang uses these buffers so that it can “splic[e] bitstreams in real-time.” (Zhang, column 4, lines 22-23). Because Zhang’s approach requires additional buffers to monitor data streams for in and out points as they are received, the system of Zhang cannot prepare the data streams prior to transmitting them to a receiver, as required by applicants’ independent claims.

Because Zhang splices bitstreams in real-time, Zhang fails to show or suggest preparing a plurality of data streams prior to transmitting the plurality of data streams to the receiver. Thus, Zhang also cannot show or suggest transmitting the multiplexed data streams to the receiver after preparing the plurality of data streams, as required by applicants’ independent claims.

In addition, applicants respectfully submit that Zhang does not show or suggest the feature of “changing the multiplexing for said plurality of streams, wherein such changing of multiplexing does

not affect the contents of said plurality of data streams.” Applicants’ approaches change the multiplexing of the data streams by multiplexing at a higher rate. Changing the multiplexing of the data streams does not affect the content of the data streams. Unlike applicants’ approaches, Zhang clearly discloses that it physically changes the contents of the data streams by re-encoding the streams. For example, Zhang states that:

[I]f the exit point has been reached, the method proceeds to step 1310. In step 1310, the method continues by recoding frames around the splice point to provide and use the appropriate anchor frames. If necessary, the anchor frames of the second stream are re-encoded to I-frames along with any B-frames that reference frames before the exit point.

(Zhang, column 20, lines 41-47). Zhang re-encodes frames around the splice point and adds appropriate anchor frames to ensure buffer compliance, eliminate rate mismatching (e.g., constant bit rate versus variable bit rate), ensure anchor frame regeneration, and ensure time base correctness.

(Zhang, column 21, lines 23-26).

Accordingly, for at least these reasons, independent claims 1 and 13 are not unpatentable over Hurst in view of Zhang. Thus, the rejections of the claims should be withdrawn. In addition, dependent claims 2, 3, 6-9, and 11-15, each of which depends from one of independent claims 1 and 13, are allowable for at least the same reasons that the independent claims are patentable as set forth above. Therefore, applicants respectfully request that the Examiner withdraw the rejections of applicants’ dependent claims.

VI. Conclusion

The foregoing demonstrates that claims 1-3, 6-9, and 11-15 are patentable. This application is therefore in condition for allowance. Reconsideration and prompt allowance are accordingly respectfully requested.

If it is believed that such contact would further the examination of the application, applicants courteously request that the Examiner contact the undersigned at the number listed below to schedule an interview at a time convenient for the Examiner.

AUTHORIZATION

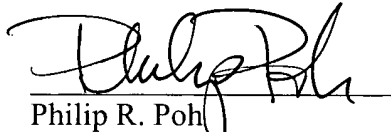
The Commissioner is hereby authorized to charge any additional fees, which may be required for this Amendment, or credit any overpayment to Deposit Account No. 08-0219.

In the event that an Extension of Time is required, or which may be required in addition to that requested in a petition for an Extension of Time, the Commissioner is requested to grant a petition for that Extension of Time which is required to make this response timely and is hereby authorized to charge any fee for such an Extension of Time or credit any overpayment for an Extension of Time to Deposit Account No. 08-0219.

Respectfully submitted,

WILMER CUTLER PICKERING
HALE AND DORR LLP

Date: January 3, 2007


Philip R. Poh
Registration No. 51,176
Agent for Applicants

Wilmer Cutler Pickering
Hale and Dorr LLP
399 Park Avenue
New York, NY 10022
Tel. 212-230-8800
Fax. 212-230-8888
Customer No. 28089